

## PATENT ABSTRACTS OF JAPAN

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(21)Application number : 08-006416

(71)Applicant : SHIBAURA ENG WORKS CO LTD

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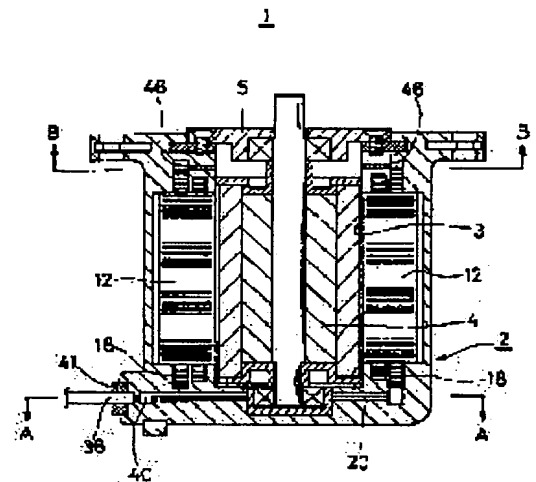
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## (54) ON-BOARD MOTOR

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To obtain a on-board motor having excellent vibration resistance and shock resistance by molding a stator, an outgoing line for the coil of the stator and a wiring member for connecting the outgoing line to the outside of the motor of a molding resin.

**SOLUTION:** A motor 1 is assembled, and stators 12, coils 18, wiring members 20, fourth connecting plates 46 and the tip section of a lead wire 36 are molded integrally of a molding resin. Consequently, a casing 2 for the motor 1 is completed. A place, where the tip section of the lead wire 36 is fixed by a caulking section 40, is mounted beforehand on a bush 41, and the bush 41 is also molded integrally. Accordingly, since the stators 12 and the wiring members 20, etc., are molded integrally of the molding resin, wirings are not slipped off by the vibrations, etc., of an automobile even when the motor 1 is installed to the automobile and used. Since the casing 2 is further molded, a heat-dissipation effect is acquired.



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**CLAIMS**

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[Claim(s)]

[Claim 1] The motor for mount characterized by carrying out mold shaping of the wiring member for connecting the leader and said leader of a coil of a stator and said stator to the motor exterior with mold resin.

[Claim 2] Said wiring member is a motor for mount according to claim 1 characterized by consisting of the conductive conductive layer section which has a coil connection and an external terminal area, and an insulating layer by which the laminating was carried out to said conductive layer section, connecting the leader of said coil to said coil connection, and connecting lead wire to said external terminal area.

[Claim 3] Said wiring member is a motor for mount according to claim 2 characterized by for the shape of an abbreviation ring having been wound around the tape-like coil by the projection and said stator from the periphery section of nothing and said conductive layer section, and said coil connection and said external terminal area connecting electrically the leader and said coil connection of a coil of the shape of said tape.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the motor for mount.

[0002]

[Description of the Prior Art] Various motors, such as a motor attached in an engine and a motor to which a wiper is moved, are attached in automobiles, such as a passenger car and a truck.

[0003] In this motor for mount, to a stator, it bands together with a string, or lead wire and a coil are fixed through a PC board as a connection method of the coil from the stator of a motor, and the lead end-of-line end from the outside.

[0004] While specifically soldering the tip of lead wire to the coil which has come out of the stator, along with the stator, it banded together with a string etc., and a coil and lead wire are fixed with the varnish etc., after [ this ] banding together.

[0005]

[Problem(s) to be Solved by the Invention] However, the immobilization may separate by vibration of an automobile that it is the approach of banding together with a string from a coil and lead wire as mentioned above, and there was a trouble of being weak, to vibration-proof and an impact-proof.

[0006] Moreover, in the manufacture approach, it had to band together that it was the above-mentioned approach using the string, and there was also a problem that the activity was time and effort.

[0007] Then, this invention offers the motor for mount excellent in vibration-proof and shock resistance in view of the above-mentioned trouble.

[0008]

[Means for Solving the Problem] The motor for mount of claim 1 of this invention carries out mold shaping of the wiring member for connecting the leader and said leader of a coil of a stator and said stator to the motor exterior with mold resin.

[0009] In the thing of claim 1, said wiring member consists of the conductive conductive layer section which has a coil connection and an external terminal area, and an insulating layer by which the laminating was carried out to said conductive layer section, and the motor for mount of claim 2 connects the leader of said coil to said coil connection, and connects lead wire to said external terminal area.

[0010] As for the motor for mount of claim 3, in the thing of claim 2, the shape of an abbreviation ring is wound around a tape-like coil to said coil connection and said external terminal area by a projection and said stator from the periphery section of nothing and said conductive layer section, and said wiring member connects electrically the leader and said coil connection of a coil of the shape of said tape.

[0011] Since mold shaping of a stator, a coil, and the wiring member is carried out to it being the above-mentioned motor for mount with mold resin at one, it excels in vibration-proof and shock resistance, and the connection part of the leader of a coil and a wiring member does not separate.

[0012]

[Embodiment of the Invention] Hereafter, one example of this invention is explained based on a drawing.

[0013] In addition, the motor 1 shown in drawing 1 is a motor carried in an automobile, and is a motor of nine poles which consist of three phase circuits of U phase, V phase, and W phase.

[0014] A sign 12 is a stator and has the ring section 14 and nine lobes 16 in which method \*\* of inside projected from now on. The lobe 16 is making the shape of a flat surface of T characters.

[0015] A sign 18 is the coil of the shape of a tape twisted around each lobe 16 of a stator 12. The upper limit section (leader of a coil 18) of this coil 18 is pulled out above a stator 12, and, as for the lower limit section (leader of a coil 18) of a coil 18, the stator 12 is pulled out caudad.

[0016] A sign 20 is a wiring member to which a stator 12 is allotted caudad, as shown in drawing 5 . As for the wiring member 20, the laminating of the 1st connection plate 22 for nothing and U phases, the 2nd connection plate 24 for V phases, and the 3rd connection plate for W phases is carried out in the shape of a ring of a forward nonagon.

[0017] First, the structure of the 1st connection plate 22 is explained.

[0018] The 1st connection plate 22 consists of an insulating layer 30 by which the laminating was carried out to the conductive layer 28 which consists of a copper plate, and this conductive layer 28. In the conductive layer 28, in each side of a forward nonagon, it projected from the three sides in the location in every 120 degrees, and pieces U1, U2, and U3 have projected. Each piece of a protrusion consists of a level piece 32 projected horizontally and a piece 34 of a \*\* top which started from this level piece 32. Moreover, in the side of 1 of a conductive layer 28, the piece 38 of the 1st external terminal protrusion for connecting the lead wire 36 from the outside has projected. The caulking section 40 for closing lead wire 36 is formed in this piece 38 of the 1st external terminal protrusion (refer to drawing 6 ).

[0019] Although the 2nd connection plate 24 is the almost same configuration as the 1st connection plate 22, it projected from the three sides among each nine sides, and pieces V1, V2, and V3 have projected it. The protrusion location of the pieces V1, V2, and V3 of a protrusion is established in the location which shifted from the 1st connection plate 22. Moreover, the piece 42 of the 2nd external terminal protrusion has projected (refer to drawing 6 ).

[0020] The 3rd connection plate 26 also had the almost same configuration as the 1st connection plate 22, and projected from the three sides among each nine sides, and pieces W1 and W2 and W3 have projected it. The protrusion location of the pieces W1 and W2 of a protrusion and W3 is established in the location which shifted from the 1st connection plate 22 and the 2nd connection plate 24. Moreover, the piece 44 of the 3rd external terminal protrusion is shared with piece W3 of a protrusion (refer to drawing 6 ).

[0021] And the laminating of these 1st connection plate 22, the 2nd connection plate 24, and the 3rd connection plate 26 is carried out, and they constitute the wiring member 20.

[0022] A sign 46 is the 4th connection plate for neutron points arranged on the lower part of a stator 12, as shown in drawing 7 . This 4th connection plate 46 projected the shape of a ring of a forward nonagon from nothing and each side, and pieces d1-d9 have projected.

[0023] The assembly approach of this motor 1 is explained in order.

[0024] \*\* Allot the wiring member 20 to the lower part of a stator 12, and arrange the 4th connection plate 46 on the upper part of a stator 12.

[0025] \*\* Weld the upper limit section of the tape-like coil 18 wound around the lobe 16 of a stator 12, respectively to each protrusion sides U1, U2, U3, V1, V2, and V3 of the wiring member 22 and W1 and W2, and W3. Since a coil 18 is a tape-like as shown in drawing 8 , this welding process welds the upper limit section of a coil 18 along with the piece 34 of a \*\* top. Thereby, a coil 18 can be easily attached in the wiring member 22.

[0026] \*\* Weld like the above the lower limit section of the coil 18 projected from the lower part of a lobe 16, respectively to each part of each pieces d1-d9 of a protrusion of the 4th connection plate 46.

[0027] In addition, the wiring approach of each coil 18 of a stator 12 is wired along the electrical circuit of drawing 9 .

[0028] \*\* Carry out the mold of the point of a stator 12, a coil 18, the wiring member 20 and the 4th connection plate 46, and lead wire 36 to one with mold resin after assembling as mentioned above. The casing 2 of a motor 1 is completed by this. In addition, the point of lead wire 36 attaches in the bush 41 the part fixed in the caulking section 40, and carries out the mold also of this bush 41 to one.

[0029] \*\* While inserting a rotator 4 in the cavernous section 3 of the casing 2 interior as shown in drawing 2 after casing 2 is completed, fix a rotator 4 to casing 2 free [ rotation ] with a cover plate 5. In this case, the screw stop of the cover plate 5 is carried out to casing 2.

[0030] \*\* As shown in drawing 6 , attach lead wire 36 in the piece 38 (it sets to the electrical circuit of drawing 9 , and is U4) of the 1st external terminal protrusion. This means of attachment are attached by the caulking section 40 prepared in the piece 38 (U4) of the 1st external terminal protrusion. Lead wire 36 is attached also like the piece 42 (V4) of the 2nd external terminal protrusion. Lead wire 36 is attached also like the piece 44 (W4) of the 3rd external terminal protrusion.

[0031] Since the stator 12, the wiring member 20, etc. are fabricated to one with mold resin as it is the motor 1 of the above-mentioned configuration, even when it is used having attached the motor 1 in the automobile, wiring does not separate by vibration of an automobile etc. and vibratility-proof and shock resistance are excellent. Furthermore, since the casing 2 of a motor 1 is formed with mold resin, the heat dissipation

effectiveness of a motor 1 is promoted.

[0032]

[Effect of the Invention] Since the mold of a leader, a wiring member, etc. of the coil of a stator and a stator is carried out to it being the motor for mount of this invention with mold resin, even if it uses it by the above, loading an automobile etc. with this motor, vibratility-proof and shock resistance are excellent. Therefore, the dependability of a motor can be improved.

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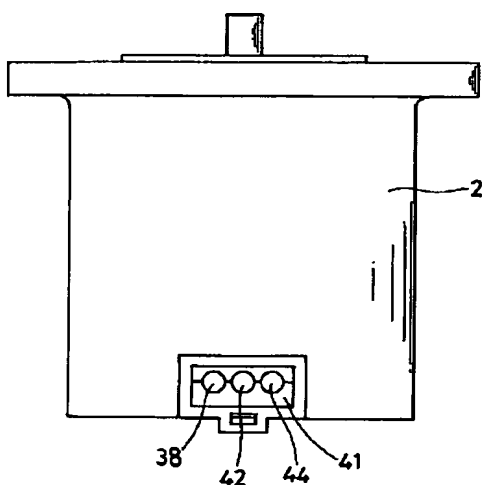
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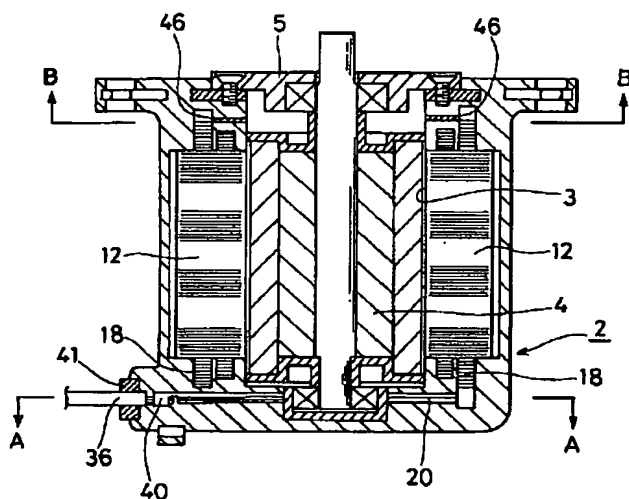
[Drawing 1]

1

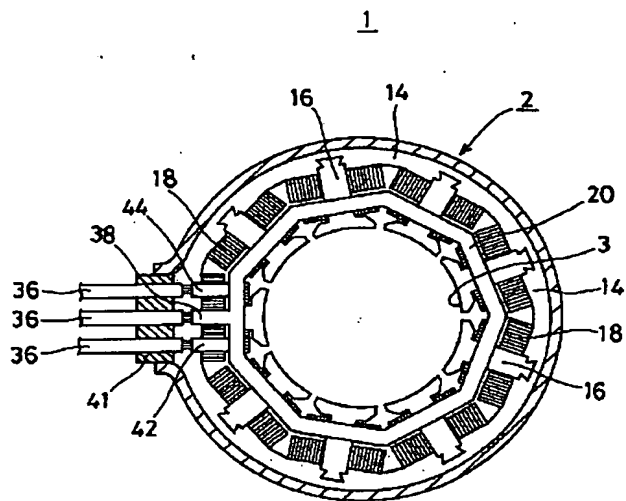


[Drawing 2]

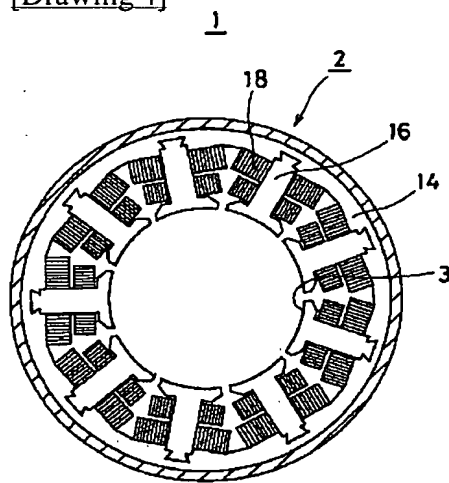
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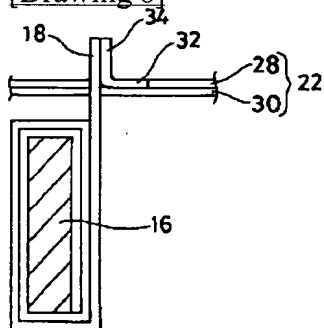
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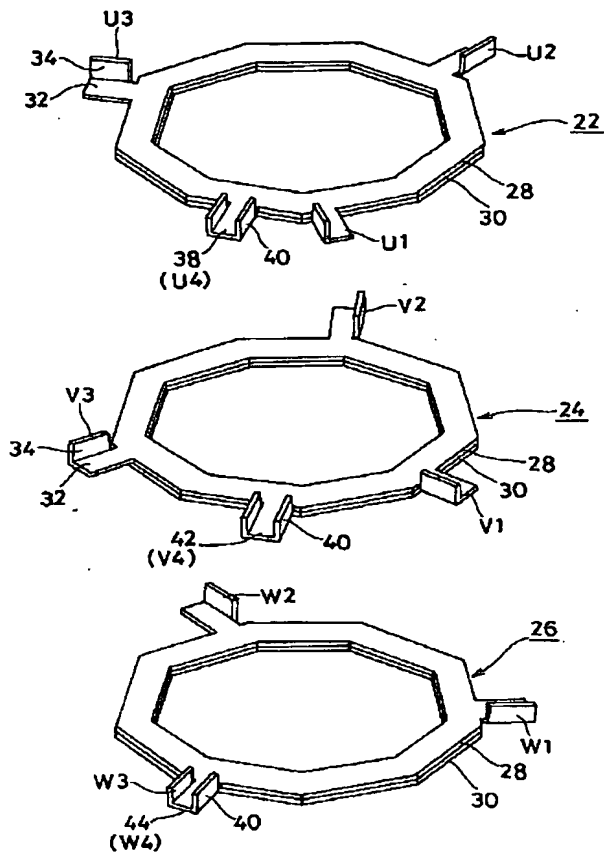
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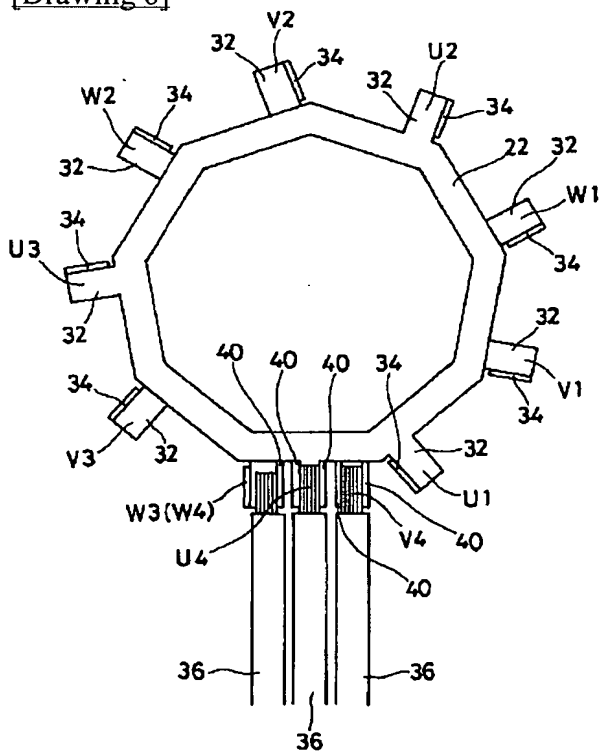
[Drawing 8]



[Drawing 5]

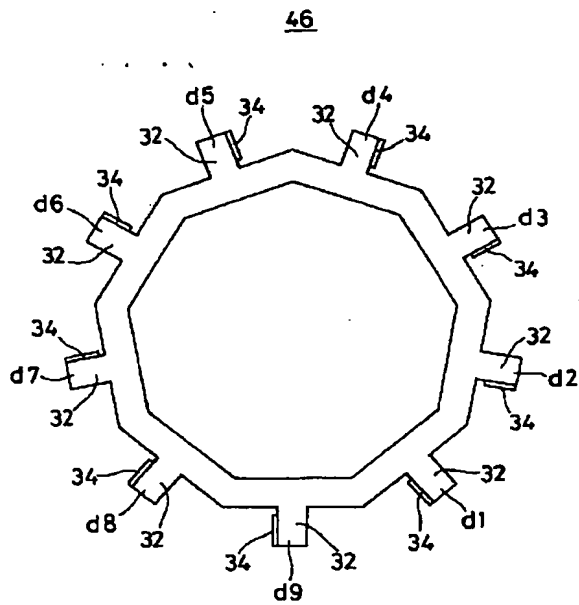
20

[Drawing 6]

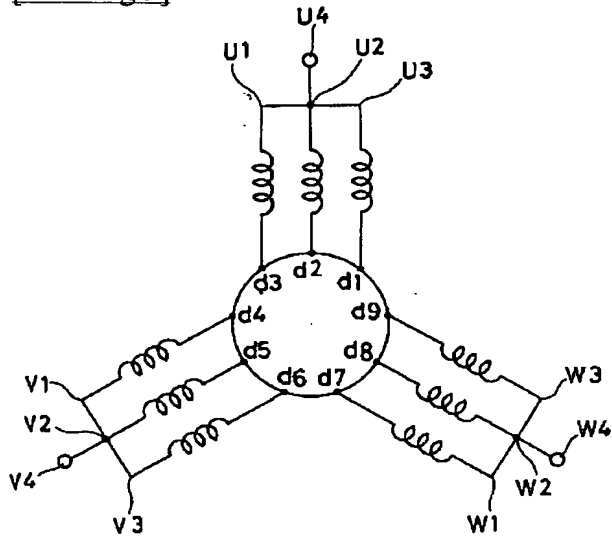


[Drawing 7]





[Drawing 9]



[Translation done.]

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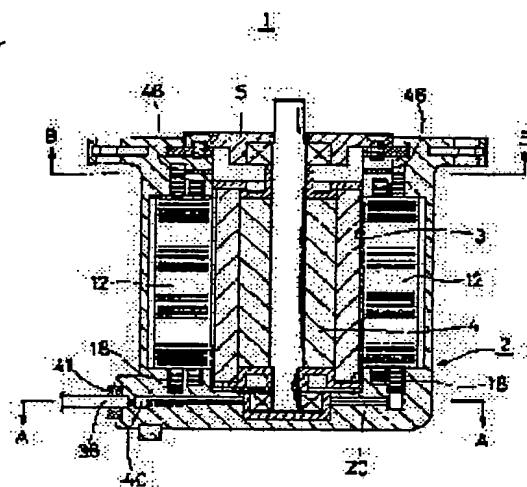
(72)Inventor : KAWAKAMI TSUKASA

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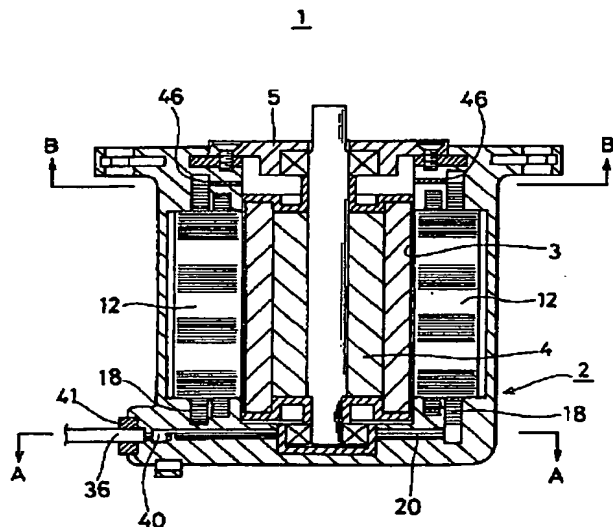
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(54) 【発明の名称】 車載用モータ

(57) 【要約】

【課題】 耐振動及び耐衝撃性に優れた車載用モータを提供する。

【解決手段】 固定子12、前記固定子のコイル18の引出し線及び前記引出し線をモータ外部へ接続するための配線部材20を、モールド樹脂によりモールド成形したものである。



## 【特許請求の範囲】

【請求項1】固定子、前記固定子のコイルの引出し線及び前記引出し線をモータ外部へ接続するための配線部材を、モールド樹脂によりモールド成形したことを特徴とする車載用モータ。

【請求項2】前記配線部材は、コイル接続部と外部端子部とを有する導電性の導電層部と、

前記導電層部に積層された絶縁層部とよりなり、前記コイル接続部に前記コイルの引出し線を接続し、前記外部端子部にリード線を接続することを特徴とする請求項1記載の車載用モータ。

【請求項3】前記配線部材は、略リング状をなし、前記導電層部の外周部より前記コイル接続部及び前記外部端子部が突出し、前記固定子には、テープ状のコイルが巻回され、前記テープ状のコイルの引出し線と前記コイル接続部とを電気的に接続したことを特徴とする請求項2記載の車載用モータ。

## 【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、車載用のモータに関するものである。

【0002】

【従来の技術】乗用車、トラックなどの自動車には、エンジンに取付けられるモータや、ワイパーを動かすモータなど、種々のモータが取付けられている。

【0003】この車載用モータにおいて、モータの固定子からのコイルと、外部からのリード線端末の接続方法としては、リード線及びコイルを固定子に対し紐で結束したり、PC板を介して固定している。

【0004】具体的には、固定子から出ているコイルにリード線の先端を半田付けするとともに、コイルとリード線を固定子に沿って紐等で結束し、この結束した後にワニス等で固着している。

【0005】

【発明が解決しようとする課題】しかしながら、上記のように、コイル及びリード線を紐で結束する方法であると、自動車の振動によって、その固定が外れたりする場合があります、耐振動及び耐衝撃に対し弱いという問題点があった。

【0006】また、上記方法であると、製造方法において紐を用いて結束しなければならず、その作業が手間であるという問題もあった。

【0007】そこで、本発明は上記問題点に鑑み、耐振動及び耐衝撃性に優れた車載用モータを提供するものである。

【0008】

【課題を解決するための手段】本発明の請求項1の車載用モータは、固定子、前記固定子のコイルの引出し線及

び前記引出し線をモータ外部へ接続するための配線部材を、モールド樹脂によりモールド成形したものである。

【0009】請求項2の車載用モータは、請求項1のものにおいて、前記配線部材は、コイル接続部と外部端子部とを有する導電性の導電層部と、前記導電層部に積層された絶縁層部とよりなり、前記コイル接続部に前記コイルの引出し線を接続し、前記外部端子部にリード線を接続するものである。

【0010】請求項3の車載用モータは、請求項2のものにおいて、前記配線部材は、略リング状をなし、前記導電層部の外周部より前記コイル接続部及び前記外部端子部が突出し、前記固定子には、テープ状のコイルが巻回され、前記テープ状のコイルの引出し線と前記コイル接続部とを電気的に接続したものである。

【0011】上記の車載用モータであると、固定子、コイル及び配線部材をモールド樹脂によって一体にモールド成形しているため、耐振動及び耐衝撃性に優れており、コイルの引出し線と配線部材との接続部分が外れたりすることがない。

【0012】

【発明の実施の形態】以下、本発明の一実施例を図面に基づいて説明する。

【0013】なお、図1に示すモータ1は、自動車に搭載されるモータであって、U相、V相、W相の3相からなる9極のモータである。

【0014】符号12は、固定子であって、リング部14と、これから内方に突出した9個の突出部16を有する。突出部16は、平面T字状をなしている。

【0015】符号18は、固定子12の各突出部16に巻き付けられているテープ状のコイルである。このコイル18の上端部（コイル18の引出し線）は、固定子12の上方に引き出され、コイル18の下端部（コイル18の引出し線）は、固定子12の下方に引き出されている。

【0016】符号20は、図5に示すように、固定子12の下方に配される配線部材である。配線部材20は、正九角形のリング状をなし、U相用の第1接続板22とV相用の第2接続板24とW相用の第3接続板が積層されたものである。

【0017】まず、第1接続板22の構造について説明する。

【0018】第1接続板22は、銅板よりなる導電層28とこの導電層28に積層された絶縁層30よりなる。導電層28において、正九角形の各辺において、120度毎の位置にある3つの辺から突出片U1、U2、U3が突出している。各突出片は、水平に突出した水平片32とこの水平片32より立上られた立上片34とよりなる。また、導電層28の一の辺には、外部からのリード線36を接続するための第1外部端子突出片38が突出している。この第1外部端子突出片38には、リード線

36をかしめるためのカシメ部40が設けられている(図6参照)。

【0019】第2接続板24は、第1接続板22とほぼ同じ構成であるが、9つの各辺のうち、3つの辺から突出片V1、V2、V3が突出している。突出片V1、V2、V3の突出位置は第1接続板22とずれた位置に設けられている。また、第2外部端子突出片42が突出している(図6参照)。

【0020】第3接続板26も、第1接続板22とほぼ同じ構成を有し、9つの各辺のうち、3つの辺から突出片W1、W2、W3が突出している。突出片W1、W2、W3の突出位置は第1接続板22、第2接続板24とずれた位置に設けられている。また、第3外部端子突出片44は、突出片W3とは共有となっている(図6参照)。

【0021】そして、これら第1接続板22と第2接続板24と第3接続板26が積層されて配線部材20を構成している。

【0022】符号46は、図7に示すように、固定子12の下部に配される中性子点用の第4接続板である。この第4接続板46は、正九角形のリング状をなし、各辺から突出片d1～d9が突出している。

【0023】このモータ1の組立て方法について順番に説明していく。

【0024】① 固定子12の下部に配線部材20を配し、固定子12の上部に第4接続板46を配する。

【0025】② 固定子12の突出部16にそれぞれ巻かれたテーブ状のコイル18の上端部を配線部材22の各突出辺U1、U2、U3、V1、V2、V3及びW1、W2、W3に溶接する。この溶接方法は、図8に示すように、コイル18がテーブ状であるため、コイル18の上端部を立上片34に沿って溶接するものである。これにより簡単にコイル18を配線部材22に取付けることができる。

【0026】③ 突出部16の下方から突出したコイル18の下端部は、第4接続板46の各突出片d1～d9の各部分に上記と同様にそれぞれ溶接する。

【0027】なお、固定子12の各コイル18の配線方法は、図9の電気回路に沿って配線されている。

【0028】④ 上記のように組立てた後、固定子12、コイル18、配線部材20、及び第4接続板46、リード線36の先端部をモールド樹脂によって一体にモールドする。これによって、モータ1のケーシング2が完成する。なお、リード線36の先端部はカシメ部40で固定した箇所をブッシュ41に取り付けておき、このブッシュ41も一体にモールドする。

【0029】⑤ ケーシング2が完成した後に、図2に示すように、ケーシング2内部の空洞部3に回転子4を

嵌め込むとともに、蓋板5によって、回転子4をケーシング2に回転自在に固定する。この場合に蓋板5は、ケーシング2にネジ止めする。

【0030】⑥ 図6に示すように、第1外部端子突出片38(図9の電気回路においてはU4)にリード線36を取付ける。この取付方法は、第1外部端子突出片38(U4)に設けられたカシメ部40によって取付ける。第2外部端子突出片42(V4)にも同様にリード線36を取付ける。第3外部端子突出片44(W4)にも同様にリード線36を取付ける。

【0031】上記構成のモータ1であると、固定子12及び配線部材20などをモールド樹脂によって一体に成形しているため、モータ1を自動車に取付けて使用した場合でも、自動車の振動等によって配線が外れたりすることがなく、耐振動性及び耐衝撃性が優れている。さらに、モータ1のケーシング2がモールド樹脂によって形成されているため、モータ1の放熱効果が促進される。

【0032】

【発明の効果】以上により、本発明の車載用モータであると、固定子、固定子のコイルの引出し線、及び配線部材等がモールド樹脂によってモールドされているため、このモータを自動車等に積んで使用しても、耐振動性及び耐衝撃性が優れている。したがって、モータの信頼性を向上することができる。

【図面の簡単な説明】

【図1】本発明の一実施例を示すモータの正面図である。

【図2】モータの縦断面図である。

【図3】図2におけるA-A線断面図である。

【図4】図2におけるB-B線断面図である。

【図5】配線部材の分解斜視図である。

【図6】配線部材の平面図である。

【図7】第4接続板の平面図である。

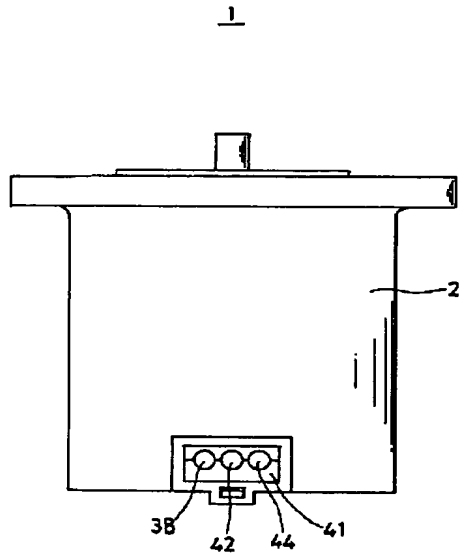
【図8】コイルを突出片に取付ける状態の説明図である。

【図9】モータの電気配線図である。

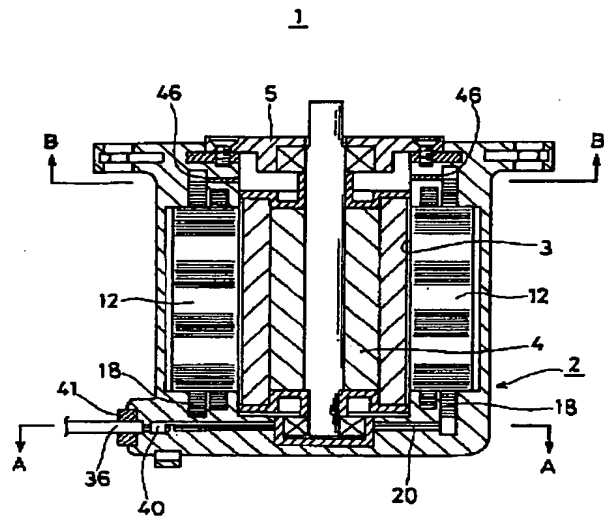
【符号の説明】

- |    |       |
|----|-------|
| 1  | モータ   |
| 2  | ケーシング |
| 12 | 固定子   |
| 18 | コイル   |
| 20 | 配線部材  |
| 22 | 第1接続板 |
| 24 | 第2接続板 |
| 26 | 第3接続板 |
| 32 | 水平片   |
| 34 | 立上片   |
| 36 | リード線  |

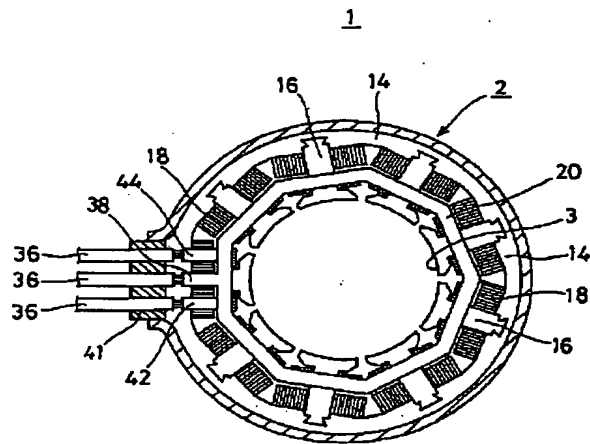
【図1】



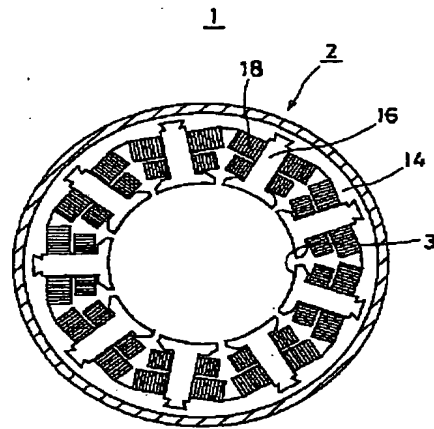
【図2】



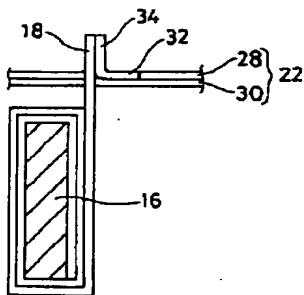
【図3】



【図4】

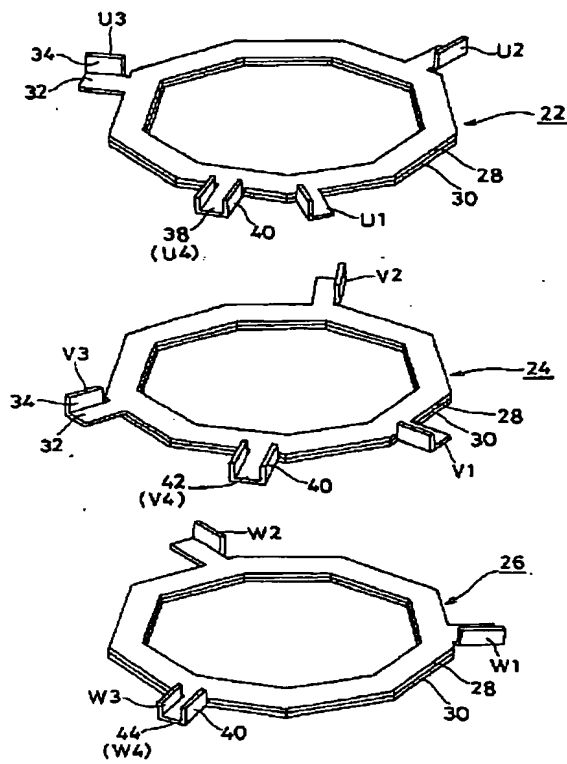


【図8】

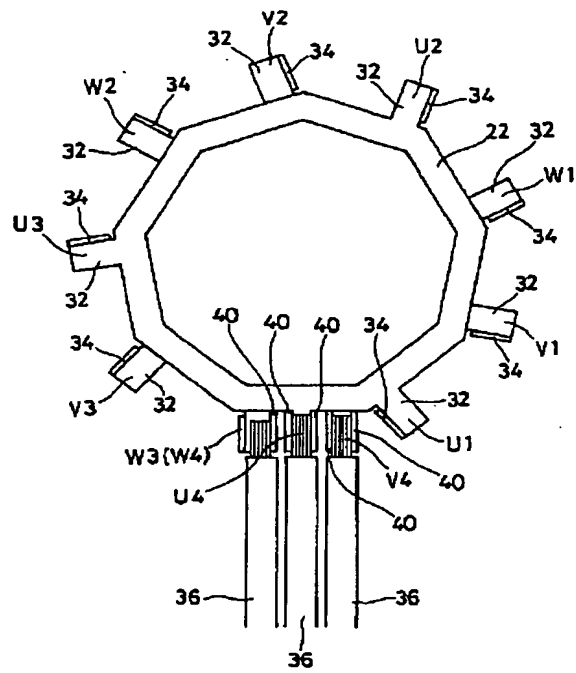


【図5】

20

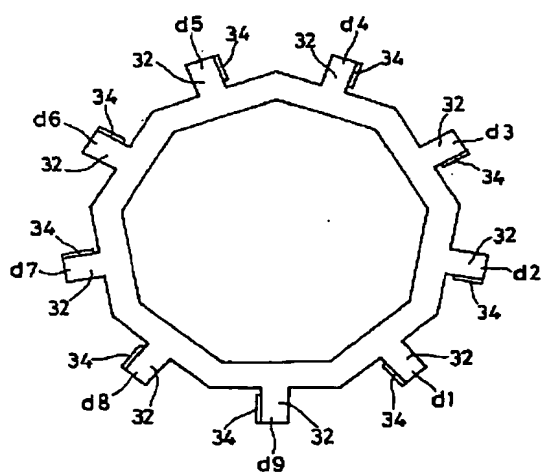


【図6】

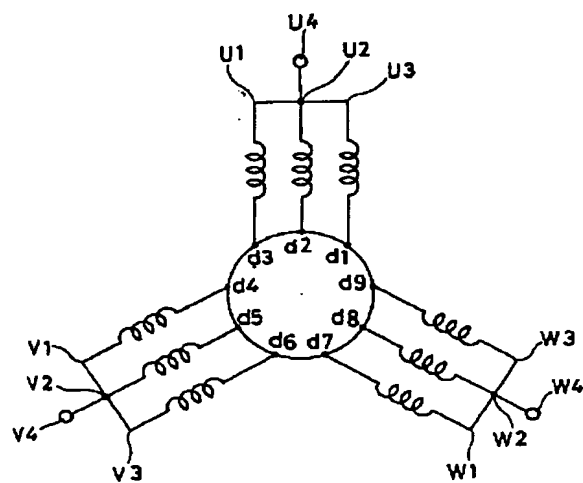


【図7】

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【図9】



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